

AMENDMENTS TO THE DRAWINGS

The attached sheet(s) of drawings includes changes to FIGs. 3, 6 and 13.

Attachment: Replacement sheets for FIGs. 3, 6 and 13.

REMARKS

This Amendment responds to the Office Action mailed July 19, 2007, in the above-identified application. Based on the foregoing amendments and the following comments, reconsideration and allowance of the application are respectfully requested.

Claims 1-22, 25 and 26 were previously pending in the application. Claims 13-22, 25 and 26 have been withdrawn from consideration. By this Amendment, claims 1, 3, 4, 6, 8, 9, 11, and 12 are amended. Claims 2 and 7 are canceled without prejudice or disclaimer. The amendments find clear support in the original specification at least at page 13, lines 24-28; page 23, lines 29-33; and page 36, lines 28-32, and in the original claims. No new matter has been added.

The restriction requirement was made final, and claims 13-22 and 25-26 were withdrawn from further consideration by the Examiner. However, as amended in response to the restriction requirement, claim 13 depends from claim 1, claim 18 depends from claim 6, claim 25 depends from claim 11, and claim 26 depends from claim 12. Accordingly, amended claims 13-22 and 25-26 depend from the elected claims and should be allowable upon allowance of the respective parent claims.

The Examiner has objected to the Abstract because it contains improper legal phraseology. The Abstract has been amended and is compliance with MPEP §608.01(b). Accordingly, withdrawal of the objection to the Abstract is respectfully requested.

The Examiner has objected to the drawings because the blocks in FIGs. 3, 6 and 13 should be provided with descriptive labels. Replacement drawings for FIGs. 3, 6 and 13 are enclosed herewith. In the replacement drawings, the blocks are labeled. Accordingly, withdrawal of the objection to the drawings is respectfully requested.

The Examiner has rejected claims 1-12 under 35 U.S.C. §102(b) as anticipated by Ichiyoshi (US 5,991,280). The rejection is respectfully traversed in view of the amended claims.

Ichiyoshi discloses a method and system for controlling TDMA (Time Division Multiple Access) timing in a satellite communication network. A plurality of land earth stations and a plurality of land terminal stations are provided and are capable of communicating with each other. A land earth station generates a transmission timing on the basis of its own time base and detects a receiving time of a signal from another land earth station. Time errors are calculated so as to synchronise the time bases of the respective land earth stations.

By contrast, the present invention relates to a system for applying orbit corrections to satellites (pg. 1, lines 28-29). The position and movement of the satellites are determined by a pseudo ranging configuration (pg. 7, line 33 to pg. 8, line 2 and pg. 12, line 31) which requires time synchronisation between the receiving stations (pg. 8, lines 6-8 and pg. 12, lines 32-33). The invention provides a system which can be operated efficiently when the satellite uses a narrow spot beam transmission.

To this end, at least one receiving station includes a correlation receiver, which yields a correlation gain, for receiving the reference signal with sufficient accuracy in a narrow spot beam transmission context. The reference signal can be received outside the main narrow spot beam of the satellite or footprint of the spot beam (pg. 13, lines 24-28; pg. 23, lines 29-33; and pg. 36, lines 28-32). The reference station may be located outside the coverage area of the payload signal (pg. 13, lines 3-4), and the large angle intersection therefore leads to higher accuracy. This feature is not disclosed or suggested by Ichiyoshi.

Amended claim 1 is directed to a system for providing a common time base between different locations on Earth and requires, in part, a first spacecraft, a plurality of receiving stations at different locations on Earth, synchronisation means adapted to provide a synchronised time base between the plurality of receiving stations, and correction means adapted to correct the synchronisation error of the synchronised time base by the known position of the spacecraft and in accordance with the propagation time of each received reference signal. At least one receiving station comprises a correlation receiver yielding a correlation gain for receiving the first reference signal. The spacecraft transmits in a main

narrow spot beam, and the correlation receiver is suitable for receiving the reference signal outside the main narrow spot beam of the spacecraft.

Ichiyoshi does not disclose or suggest a system as defined by amended claim 1. In particular, Ichiyoshi does not disclose or suggest a system wherein at least one receiving station comprises a correlation receiver having a correlation gain for receiving a reference signal. The Examiner asserts that Ichiyoshi describes a receiving station comprising a correlation receiver at Col. 1, line 62 to Col. 2, line 4. However, the referenced passage of Ichiyoshi states that it is necessary to compensate for the limitation in antenna gain and transmission power in the land earth station by increasing the antenna gain and the transmission power in the communication satellite. Ichiyoshi states that this can be done by using an antenna having a radius as large as possible and using a mobile link which utilizes a multi-beam covering a wider area. Thus, Ichiyoshi contains no teaching or disclosure of a correlation receiver. Instead, Ichiyoshi describes a multi-beam covering a wide area rather than a narrow spot beam, as required by amended claim 1. For at least these reasons, amended claim 1 is clearly and patentably distinguished over Ichiyoshi, and withdrawal of the rejection is respectfully requested.

Claims 3-5 depend from claim 1 and are patentable over Ichiyoshi for at least the same reasons as amended claim 1.

Amended claim 6 is directed to a method for providing a common time base between different locations on Earth with the aid of a spacecraft and contains method limitations that parallel the apparatus limitations of claim 1. In particular, amended claim 6 recites correcting the synchronisation error of the synchronised time base by the known position of the spacecraft and in accordance with the propagation time of each received reference signal, wherein at least one receiving station applies a correlation method yielding a correlation gain for receiving the reference signal, the first spacecraft transmitting in a main narrow spot beam and the correlation receiver receiving the reference signal outside the main narrow spot beam of the spacecraft. Claim 6 is distinguished over Ichiyoshi for the reasons discussed above in connection with claim 1. In particular, Ichiyoshi contains no disclosure or suggestion of a

correlation method yielding a correlation gain for receiving the reference signal and no disclosure or suggestion of the spacecraft transmitting in a main narrow spot beam and the correlation receiver receiving the reference signal outside the main narrow spot beam of the spacecraft, as claimed. For at least these reasons, amended claim 6 is clearly and patentably distinguished over Ichiyoshi, and withdrawal of the rejection is respectfully requested.

Claims 8-10 depend from claim 6 and are patentable over Ichiyoshi for at least the same reasons as claim 6.

Amended claim 11 is directed to a processing station for providing a common time base between different locations on Earth with the aid of a spacecraft and requires, in part, propagation time data receiving means adapted to receive propagation time data from a plurality of receiving stations at different locations on Earth, and correction means adapt to correct a synchronisation error of the synchronised time base by the known position of the spacecraft in accordance with the propagation time of each received reference signal. At least one receiving station comprises a correlation receiver yielding a correlation gain for receiving the reference signal. The spacecraft transmits in a main narrow spot beam, and the correlation receiver is suitable for receiving the reference signal outside the main narrow spot beam of the spacecraft.

Ichiyoshi does not disclose or suggest a processing station as defined by amended claim 11. As discussed above, Ichiyoshi contains no disclosure or suggestion of a correlation receiver and no disclosure or suggestion of a spacecraft that transmits in a narrow spot beam, the correlation receiver receiving the reference signal outside the main narrow spot beam of the spacecraft. For these reasons and for the reasons discussed above, amended claim 11 is clearly and patentably distinguished over Ichiyoshi, and withdrawal of the rejection is respectfully requested.

Amended claim 12 is directed to a processing method for providing a common time base between different locations on Earth with the aid of a first spacecraft and contains method limitations that parallel the apparatus limitations of claim 11. Claim 12 is clearly

patentable over Ichiyoshi for the reasons discussed above in connection with claims 1, 6 and 11, and withdrawal of the rejection is respectfully requested.

Based upon the above discussion, claims 1, 3-6 and 8-12 are in condition for allowance.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Dated: October 18, 2007

Respectfully submitted,

By William R. McClellan
William R. McClellan
Registration No.: 29,409
WOLF, GREENFIELD & SACKS, P.C.
Federal Reserve Plaza
600 Atlantic Avenue
Boston, Massachusetts 02210-2206
(617) 646-8000

Attachments

REPLACEMENT SHEETS